Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

TRANSMISSION OF SPOTTED FEVER BY THE TICK IN NATURE.*†

MARIA B. MAVER.

(From the Pathological Laboratory of the University of Chicago.)

The discovery of ticks in nature carrying the virus of spotted fever is published by Dr. Ricketts,[1] who points out the importance of this fact in connection with the theory of transmission of spotted fever by the tick.

The following experiments were made in order to throw further light on the natural infectivity of the tick.

Six hundred and fifty-six ticks were collected during the spring months of 1909: 254 of the species *D. modestus* and 402 *D. venustus*, for the purpose of studying the infectivity of the tick in nature. These ticks were found on cows, bushes, and vegetation in the Lo Lo Valley and Owl Canon, Montana, and in the vicinity of Pocatello, Idaho.

Fourteen groups were arranged, consisting of 25 male and 25 female ticks each. Each group was placed in a new tick-proof sack, with a selected guinea-pig of medium size; nine sacks of Montana ticks (*D. venustus*) and five sacks of Idaho ticks (*D. modestus*) were arranged in this way. The daily temperature of each pig was taken and the number of ticks attached noted.

In Groups IV and V the guinea-pig became infected. The ticks in both groups were gathered in the Lo Lo Valley from cows.

Experiment IV.—Normal guinea-pig 2,155 was the host of Group IV. For two weeks this pig kept up a vigorous scratching. The ticks were gathered daily and placed among the hair. Many were attached on the fourth day. On the sixth day two engorged females were found. On the 14th day the first indication of a disease was noted in a temperature of 104°, followed on the next two days by a rise to 106°, with hemorrhagic vulva; $1\frac{1}{2}$ c.c. of blood was with-

---

* Received for publication January 5, 1911.

† This work was supported by a grant from the Memorial Institute for Infectious Diseases, Chicago.

[1] *Jour. Am. Med. Assn.*, 1907, 49, p. 24.

drawn from the heart, and the pig died two days later, with lesions characteristic of spotted fever.

The heart's blood taken from the pig was immediately injected into normal guinea-pig 2,203, producing a typical fever curve with extensive vulvar changes, and death on the 13th day after injection.

This pig was also bled on the fourth day of fever and the blood passed into two normal animals. Of these guinea-pigs, one died of the disease and the other survived and proved immune to 1 c.c. of the virus carried in the "Bradley" strain. It was not possible to determine how many of these ticks transmitted the infection.

Experiment V.—This group of ticks was also gathered in the Lo Lo Valley from cows. These ticks immediately attacked normal guinea-pig 2,162; 30 males and females were found attached to the abdomen inside of 72 hours. On the fourth and succeeding days the temperature range was 104.8°, 105.6°, 105.4°, 97°, death resulting on the eighth day. No external lesions were observed. The spleen and inguinal glands were greatly enlarged. Blood was transferred to normal guinea-pigs 2,181 and 2,185 and both died of spotted fever. Blood from guinea-pig 2,185 was injected into two normal pigs. One of these pigs died of spotted fever, the other survived a typical and severe attack of the disease. A subsequent immunity test with "Bradley" passage blood proved that this pig had become immune. A "passage strain," using two pigs for each passage, was started with virus drawn from this guinea-pig at the height of the disease. Fifteen pigs in the first eight passages died with lesions typical of spotted fever. A survivor of the ninth passage proved immune to a known active virus. During the following months 49 passages of this strain were made. Of the 98 guinea-pigs infected in this manner, in 49 the disease was allowed to run its course without interference; of this latter group, 8 pigs recovered from the disease, and were thereafter immune to the active virus which had been obtained originally from a patient sick with spotted fever. In more than one-half of all these pigs hemorrhagic lesions were noted.

To render this series of experiments somewhat more complete, normal Montana ticks 190, 191, 192, 193, and 195 were allowed to feed on guinea-pigs infected with this so-called "natural tick strain." Ticks 191 and 192 became infected and transferred the disease to normal guinea-pigs 2,394 and 2,398, thus completing a tick cycle of this strain.

Five experiments were attempted with 254 ticks gathered in the vicinity of Pocatello, Idaho. Groups of 50 ticks were associated with normal guinea-pigs. In each case a short period of low temperature was noted. In experiments III and IV passage was made to normal guinea-pigs on the third day of the fever. No disease resulted and these pigs were not immune to the "Bradley" strain. In the remaining three experiments of the group no conclusive evidence of a specific infection by the Idaho ticks was obtained.